science.connect™ 2 glossary

A

acid deposition acidic materials (liquids or solids that contain sulfuric or nitric acid) that are deposited on Earth (pp. 64, 148)

acid precipitation sometimes referred to as acid rain; rain, snow, fog, or dew that has become more acidic; see *acid deposition* (p. 64)

acquired immunity body's immunity to pathogens developed throughout life by natural exposure or vaccination; see *active immunity* and *passive immunity* (p. 199)

active immunity body's process of developing antibodies against certain diseases; see *acquired immunity* (p. 199)

air bag inflatable bag instantly released from a vehicle's steering wheel or dashboard in a collision in order to restrain the occupant and lessen chance of serious injury (p. 298)

air bag, first generation first air bag design; inflated too quickly and too much, often causing injury; see *air bag* (p. 298)

air bag, second generation improvement on early air bag design; inflates more slowly without over-inflating; see *air bag* and *air bag, first generation* (p. 298)

air bag, third generation further improvement in air bag design; senses both mass of the occupant and force of collision; adjusts the inflation accordingly; see *air bag* and *air bag, second generation* (p. 298)

alloy two or more metals mixed together; looks like one metal (p. 10)

amniocentesis procedure used to determine the chromosomal make-up of a fetus and to check for abnormalities (p. 223)

antibiotic drug that fights bacterial infections by either killing bacteria or preventing them from reproducing (p. 204)

antibodies protein compounds released by white blood cells to react with and destroy antigens (p. 197)

antigens structures attached to all cells; they help the body's immune system identify pathogens (p. 197)

aseptic free of pathogens (p. 170)

B

BAC Blood Alcohol Concentration; measure of the amount of alcohol in the bloodstream; usually measured in milligrams of alcohol per millilitre of blood (p. 241)

bacteria microscopic, one-celled organisms; may be beneficial, harmful, or neither (p. 159)

balanced chemical equation reaction equation that has the same number of atoms of each element on both sides of the equation (p. 53)

booster seats vehicle safety seats designed to raise a child enough to fit the seat belt properly; allow the seat belt to restrain the child during a collision (p. 297)

botulism form of food poisoning caused by bacteria (p. 163)

braking force applied by brakes to stop a vehicle (p. 272)

braking distance distance a vehicle travels between when the driver applies the brakes and when the vehicle comes to a stop; see also *stopping distance* (p. 254)

C

carbohydrate main source of energy for the human body; usually in the form of glucose (p. 125)

cellular respiration process used by all plant and animal cells to obtain energy from food (p. 119)

chemical energy energy in chemicals; for example, potential energy from food converts to chemical energy during digestion and chemical energy in fireworks ingredients is transformed to light, sound, and heat energy when the fireworks are set off (p. 87)

chemical formula standard scientific symbol by which each chemical element or compound is known (p. 50)

chemical name standard scientific name by which each element or compound is known; established by an internationally recognized naming system (p. 50)

chemical reaction transformation that occurs when two or more substances react together, producing one or more new substances with different properties from the original substances (p. 24)

child seat vehicle safety seat designed to restrain a child (p. 297)

chlorophyll green enzyme in plant cells that enables photosynthesis (p. 118)

chloroplasts special parts of green plants that capture solar energy (p. 118)

chromosomes found in the nucleus of a cell; they contain DNA (p. 212)

climate change natural process of Earth's warming and cooling intervals; see also *global climate change* (p. 62)

coal see *fossil fuels* (p. 137)

coefficients numbers placed in front of chemical formulas to balance the number of atoms on either side of the equal sign in a chemical equation (p. 54)

combustion chemical reaction in which a substance combines with oxygen to produce heat and light; burning (pp. 28, 144)

common name name by which a common chemical is referred to in society; varies from region to region; existed long before an international naming system was created (p. 51)

communicable diseases illnesses that can be spread from one organism to another (p. 163)

Conservation of Energy, Law of energy cannot be created or destroyed, only converted from one form to another; input energy is equal to output energy (p. 92)

Conservation of Mass, Law of matter can be neither created nor destroyed (p. 52)

Conservation of Momentum, Law of total momentum of colliding objects stays the same after the collision (p. 280)

converter system in which energy is changed from one form into another (p. 86)

convertible child seats vehicle safety seat designed to restrain a child (from newborn to a mass of 18 kg) during a collision (p. 297)

corrosion process that chemically breaks down or degrades metal (p. 69)

crash cushion road feature designed to decrease the force of a collision by slowing the impulse; barrels of water or sand; see also *road safety features* and *guardrails* (p. 291)

crash test dummies manikins designed to behave like the human body during a collision; fitted with sensors to record data (p. 288)

crude oil petroleum; see *fossil fuels* (p. 137)

crumple zones parts of a vehicle designed to crush when hit, absorbing much of the energy in a collision; include hood, trunk, and fenders (p. 288)

D

depressant substance that slows reactions, lowers co-ordination, and increases drowsiness (p. 240)

disease illness; something that prevents the normal functioning of the body (p. 158)

distance change in position (p. 252)

distance/time graphs graphic representations of speed (velocity) (p. 256)

distillation process by which a substance (such as crude oil) is separated into its component parts by boiling it and then condensing the resulting vapours (p. 141)

distraction anything that takes attention away from a task (p. 237)

DNA complex molecule that contains genetic information; appears as long strands in the nucleus of each cell (p. 212)

dominant inherited traits/genes that appear in offspring; tend to cover recessive traits; see also *recessive* (p. 216)

drink practical guide for monitoring alcohol consumption that defines a standard drink as either 45 mL of hard liquor (40% alcohol), 150 mL of wine (11% alcohol), or 350 mL of beer (4% alcohol) (p. 241)

E

efficiency measure of how well energy is converted to accomplish the intended task (p. 112)

endothermic reaction any chemical reaction that absorbs heat (thermal energy) (p. 35)

energy ability to do work (p. 82)

energy change obvious or unnoticeable production or absorption of a form of energy (e.g., sound, light, heat) as part of a chemical change (p. 35)

epidemics diseases that spread through the population faster and more widely than would normally be expected; not as widespread as pandemics (p. 176)

exothermic reaction any chemical reaction that releases heat (thermal energy) (p. 35)

F

fat source of energy and energy storage in animals; see also *saturated fats* and *unsaturated fats* (p. 126)

first generation air bags see *air bag, first generation* (p. 298)

following distance distance (measured in seconds) at which it is considered safe to follow another vehicle under good driving conditions; generally accepted to be two seconds (p. 265)

force any push or pull on an object (p. 270)

fossil fuels formed from the remains of swamp vegetation and/or animals that lived about 300 million years ago; include coal, crude oil (petroleum), and natural gas (p. 136)

friction force resisting motion, caused by substances rubbing together; rubbing (p. 272)

fungi organisms that live off dead and decaying organisms or are parasitic on living organisms; see also *parasites* (singular = fungus) (p. 162)

G

galvanization process of applying a zinc coating to iron or steel to provide a protective barrier (against rust) between the metal and the environment (p. 72)

generator device that makes electricity (p. 100)

genes basic building blocks of inherited traits that form segments that make up DNA; see also *DNA* (p. 212)

genetic disorders diseases or illnesses caused by alterations to genes that affect their normal functioning (p. 220)

genetic engineering transferring genes from one organism or type of organism to another (p. 223)

genetics scientific study of how characteristics or traits are passed from parents to offspring (p. 212)

genotype letter code for the combination of genes that an organism has for each trait (p. 217)

geothermal energy heat produced within Earth (from geothermal activity) that comes close to the surface; can be used for heating or to produce electricity (p. 84)

global climate change formerly called global warming; during this process, some places on Earth may get much warmer while others may get cooler; see *climate change* (p. 149)

global warming long-term trend toward warmer temperatures accompanied by extreme climatic events and shifting of the climatic zones; more correctly called global climate change; see *global climate change* (p. 62)

glycogen starch-like carbohydrate in which the body stores glucose for future use (p. 125)

greenhouse effect phenomenon caused by an insulating layer of carbon dioxide and other gases around Earth; lets radiation in but keeps heat from escaping (p. 62)

greenhouse gases compounds (such as carbon dioxide, water, and methane) that trap heat in Earth's atmosphere (p. 62)

grief feelings of regret, sadness, or loss (p. 244)

guardrails road features designed to keep vehicles on the road and to decrease the force of a collision by slowing the impulse and thus absorbing the force of the collision; see *crash cushion* and *road safety features* (p. 291)

H

herbicide chemical that kills particular plants (p. 6)

heredity passing of characteristics from parents to offspring (p. 216)

HHPS Hazardous Household Product Symbols; safety symbols placed on hazardous products to help consumers safely use, store, and dispose of them (p. 12)

homeostasis state of equilibrium or balance; regulation of the body's internal environment (p. 123)

hybrid organism with both the dominant and recessive gene for a trait (p. 216)

hydrocarbons group of fossil fuels so named because they are made up of carbon and hydrogen (p. 144)

hydro-electric kinetic energy of moving water converted into electric energy (page 102)

I

immune system body's third line of defence against disease; targets specific pathogens (p. 195)

immunization catalyst for the body to begin producing antibodies; see *vaccination* (p. 201)

impaired unable to function normally (p. 240)

impaired driving legal term for the offence of driving with a blood alcohol concentration of more than 0.08; may be applied to other forms of impairment (p. 241)

impulse force that changes momentum; force applied over time (p. 274)

infant-only seats vehicle safety seats designed to restrain an infant during a collision and transfer the force of a crash to the infant's back (p. 297)

inflammatory response tissue swelling and increased blood flow; the body's second line of defence against further damage when the physical barrier of the skin is breached (p. 195)

inherited immunity resistance that organisms have to most diseases; passed on genetically (p. 199)

input energy energy that enters the system (p. 86)

insecticide chemical that kills particular insects (p. 6)

K

Kelvin standard scientific scale used to measure temperature (p. 15)

kilowatt hour kW•h; 1000 watts per hour (p. 110)

kinetic energy energy due to motion (p. 82)

kW•h see *kilowatt hour* (p. 110)

L

lap belts 2-point seat belts; vehicle seat belts designed to hold the occupant in place by securing the person to the seat with a strap placed across the pelvis (p. 292)

lift pump working component in an oil well located deep underground; lifts oil hundreds of metres to the surface (p. 141)

liming process of adding natural limestone to lake water to neutralize lakes that have been acidified by acid deposition; neutralizing means bringing the pH of lake water closer to normal (p. 66)

M

macrophages specialized white blood cells of the immune system that surround and destroy damaged cells, foreign protein, and pathogens (p. 195)

maintenance continual care that ensures proper functioning (p. 245)

manipulated variable aspect of an investigation that the researcher changes; see also *variable* and *responding variable* (p. 256)

metabolic needs body's needs for energy (p. 130)

metabolism rate at which a human body uses energy (p. 123)

microbes micro-organisms (p. 158)

momentum measure of an object's motion and likelihood that the object will remain in motion (p. 270)

MSDS Material Safety Data Sheet; provides detailed information (that will not fit on the product label) about chemicals found in the product (p. 19)

mutagens environmental factors (anything outside the body) that cause mutation (p. 220)

mutation change in genetic information because of an abnormal gene (change may be beneficial, harmful, or neither) (p. 220)

N

natural gas see *fossil fuels* (p. 137)

neutralization type of reaction during which an acid and a base produce a salt compound and water; the pH of these products is more neutral (closer to 7) than the pH of either reactant (p. 29)

newton N; unit of measure for force; force applied over distance (p. 108)

nitrous oxides NOx(g); naturally produced acidic gases that mix with water vapour in clouds to form acid precipitation (p. 64)

non-communicable diseases illnesses that are not caused by pathogens and so cannot be spread from one organism to another (p. 163)

non-renewable useable only once; will not form again in nature in the foreseeable future (p. 147)

O

operational features parts of a vehicle that operate all the time to keep occupants safe; include headlights, rear-view and side-view mirrors, tail and signal lights, brakes, etc. (p. 289)

output energy energy that leaves the system (p. 86)

over-the-counter drugs medications sold without a doctor's prescription (p. 204)

P

pandemics diseases that affect a large proportion of the population in many countries; farther-reaching than epidemics (p. 176)

parasites living organisms that get their nourishment from a host organism; cannot live independently (p. 162)

passive immunity antibodies introduced into the body to create immunity; see also *acquired immunity* (p. 199)

pasteurization process in which a food is heated to kill the microbes that make it spoil (p. 158)

pathogens disease-causing agents such as bacteria, viruses, fungi, and protists (p. 159)

pedigree family tree; diagram used by geneticists to show the history of a trait passed from generation to generation (p. 218)

pesticides substances that use chemicals to kill plants or animals (p. 6)

petroleum crude oil; see *fossil fuels* (p. 137)

photosynthesis process by which plants use chlorophyll and sunlight to convert carbon dioxide and water into glucose and oxygen (p. 118)

physical defences body's physical barriers against pathogens; include the skin and secretions such as mucus (p. 194)

pollutants chemicals in the air, water, or soil that cause harm to living things or to the environment (p. 64)

potential energy stored energy that can be converted into other forms (p. 82)

poverty circumstance in which basic needs for food, water, health care, and education are not met due to economic conditions (p. 166)

power rate at which energy is transferred or work is done (p. 108)

precipitate solid that forms because of a chemical change (p. 34)

products substances present after a chemical reaction (p. 28)

protein building block and source of energy for the body (p. 127)

protists single-celled organisms that share some characteristics with both animals and plants; some cause serious disease, such as malaria; see also *pathogens* (p. 162)

public health government and other agencies working together to develop and maintain healthy communities (p. 180)

pump jack working component in an oil well; lifts oil located deep underground hundreds of metres to the surface (p. 141)

Punnett square tool used by geneticists to predict the probability of offspring inheriting certain traits (p. 217)

purebred organism with identical genes for each trait; for example, the same two genes for tallness — TT or tt (p. 216)

Q

quarantine isolate sick people, often in special facilities; place where such people are isolated (page 180)

R

reactants substances present before a chemical reaction (p. 28)

reaction time time it takes to recognize a situation and act on it (p. 237)

recessive inherited traits/genes that do not appear in offspring except when both parents possess the trait; are covered by dominant traits; see also *dominant* (p. 216)

reservoir rock porous rock containing tiny droplets of oil forced there by changes in Earth's crust (p. 140)

responding variable aspect of an investigation that the researcher measures as it changes; see also *variable* and *manipulated variable* (p. 256)

restraining features hold occupant in place; prevent occupant from hitting the dashboard, windshield, sides, or roof of the car, or from being thrown out of the vehicle during a collision; include seat belts, air bags, headrests, and child seats (p. 289)

rise difference in vertical position on a graph; shows the distance interval between two points on a distance/time graph (p. 260)

road safety features traits of a road that are designed to decrease the force of a collision by slowing the impulse; see *crash cushion* and *guardrails* (p. 291)

run difference in horizontal position on a graph; shows the time interval between two points on a distance/time graph (p. 260)

rusting one type of corrosion (p. 69)

S

sacrificial metal a metal used to protect a nearby metal that is more reactive; it "draws" the corrosion; magnesium is a common sacrificial metal (p. 73)

salmonellosis form of food poisoning caused by bacteria (p. 163)

sanitary maintaining clean, germ-free conditions to help prevent disease (p. 164)

saturated fats animal fats and some oils; associated with an increased risk of heart disease (p. 126)

scrubber device installed in industrial smokestacks to remove sulfur and other pollutants formed during the combustion of coal, for example (p. 68)

second generation design see *air bag, second generation* (p. 298)

seismic survey method used by geologists to determine the location of potential oil and natural gas reservoirs by sending shock waves through the layers of Earth's crust that reflect off rock; the printout from this survey shows the underground rock formations; see *reservoir rock* (p. 140)

shoulder harness 3-point seat belt; vehicle seat belt designed to hold the occupant in place by securing the person to the seat with one strap placed across the pelvis and another strap placed across the chest from pelvis to shoulder (p. 292)

simple composition reaction in which two or more elements combine to form a compound (p. 44)

simple decomposition reaction that breaks a compound into the elements that make it up (p. 45)

slope steepness of the line on a graph; measured by dividing rise by run (p. 260)

solar cells items that convert light energy (usually energy from the Sun) into electricity (p. 107)

solar energy energy from the Sun (p. 84)

staph bacteria staphylococcus; cause of food poisoning (p. 168)

staphylococcus see *staph bacteria* (p. 168)

statistics numerical facts gathered and analyzed in an effort to identify patterns (p. 234)

sterilization process that uses steam to destroy microscopic organisms such as bacteria (p. 170)

stimulant substance that increases heart rate and speeds up reaction time; at high doses, can impair reaction time because it makes it more difficult for the person to focus (p. 240)

stopping distance distance that a vehicle travels during reaction time (until the vehicle stops); see also *braking distance* (p. 264)

structural features parts of a vehicle that protect the people inside; include crumple zones and rigid features such as heavy frame, roll cage, and side-impact beams that will not crumple or break under extreme pressure; see *crumple zones* (p. 289)

sulfur dioxide $SO_2(g)$; acidic gas that mixes with water vapour in clouds to form acid precipitation (p. 64)

synthetic human-made substance (p. 6)

synthetic fibres human-made fibres (such as cloth or thread) made in the laboratory using raw chemicals (p. 8)

synthetic polymers human-made materials consisting of long chains of molecules; often spun into thread to make fabrics or moulded to form plastics (p. 9)

T

therapy medical treatment that does not involve surgery or drugs (p. 244)

thermal energy heat (p. 84)

thermo-electric chemical energy stored in a fossil fuel and converted into thermal energy, then to kinetic energy, then to electric energy (p. 102)

thermonuclear thermal energy released when atoms are split that is used to produce electricity (p. 102)

third generation air bags see *air bag, third generation* (p. 298)

3-point seat belt see *shoulder harness* (p. 292)

time interval between events (p. 252)

total momentum sum of momentum of colliding objects; see *Conservation of Momentum, Law of* (p. 281)

trauma physical and emotional stress or injury resulting from an accident (p. 243)

turbine sets of blades put at an angle so they can collect energy from fast-moving water, steam, or wind (p. 102)

2-point seat belts see *lap belts* (p. 292)

U

unsaturated fats most vegetable oils; associated with a lowered risk of heart disease (p. 126)

V

vaccination injection of vaccine; an antigen; see *vaccine* (pp. 182, 201)

vaccine antigen injected into the body as a catalyst for the body to begin producing antibodies; see also *vaccination* and *immunization* (p. 201)

variable aspect of an investigation that changes because it is manipulated or because it responds to manipulation; see also *manipulated variable* and *responding variable* (p. 256)

velocity speed; distance travelled during a specific time interval (p. 252)

viruses microscopic, non-cellular disease-causing agents; see also *pathogens* (p. 159)

W

W•h see *watt hour* (p. 109)

watt W; international unit representing one joule of energy per second (p. 108)

watt hour W•h; one watt of power per hour; see *kW•h* (p. 109)

whiplash injury caused by muscles and ligaments of the neck being stretched or compressed too much (p. 243)

WHMIS Workplace Hazardous Materials Information System; provides detailed information on how to store, handle, and dispose of dangerous substances at work (p. 19)

wind energy kinetic energy captured by windmills (p. 84)

word equation symbolic representation of a chemical reaction that uses words to indicate reactants and products (p. 42)